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ABSTRACT

Discrepancies exist between males and females in literacy and educational attainment in important career fields throughout the world. Data were obtained on five world regions (Africa, North Africa and the Middle East, Asia, Latin America, and Europe and North America) from the "Handbook of International Data on Women" (Boulding, 1976), in which data on literacy; enrollment in literacy classes; and the number of graduates in education, law, social sciences, engineering, and agriculture were analyzed. Women are highly overrepresented in the illiterate population of the world, yet are underrepresented in literacy training courses. Women are most highly represented among graduates in education; worldwide, 50 percent of such graduates are women. Although the social sciences represent the next most highly "female" field of specialization, women are equally represented or overrepresented in only 14 percent of the nations studied. Women's representation decreases drastically in the fields of agriculture, law, and engineering. They are most highly represented in law and engineering in Europe and North Africa, education and social sciences in Latin America, and agricultural sciences in Africa. The study indicates that women's limited educational opportunities limit their advancement in many areas of life throughout the world. (KC)

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EDUCATIONAL STRATIFICATION IN CONTEMPORARY SOCIETIES

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1. Introduction

As the number of studies on sexual status grows, and as they become more sophisticated in their attempts to uncover the conditions perpetuating sexual stratification, there is a corresponding need to document the actual range of variation that exists in sexual stratification in contemporary nations. This is necessary and important for several reasons. First, in most studies of sexual stratification, very little attention has been paid to the actual variation in women's position in time and space. This neglect is largely responsible for the development of the many unicausal explanations of women's position which have been proposed in the social science literature. Moreover, this neglect of the variation in women's position has often led many researchers to presume that women's status is universally low, a tendency which has the unfortunate consequence of failing to credit women with a wide range of accomplishments. This, in turn, often perpetuates myths concerning women's biological, social, and cultural inferiority.

Second, in an attempt to uncover barriers to women's advancement, a first and necessary step must be the elucidation of the conditions under which women can be expected to have high status in any particular social realm. Lastly, since World War II, there has been a general feeling in many modern societies that there is a new ideology of female equality. The extent to which this ideology has been implemented in practice, however, has not been assessed on a cross-national basis.

One of the most important areas in which to evaluate this variation is in the educational sphere, since it has been proposed that women's position in this realm is perhaps the key to the status of women in the other areas of

life. For instance, without an adequate education, women may find it difficult to qualify for all but the lowest paying jobs, will tend to remain unaware of their legal rights, and may find it difficult to exercise their political rights effectively (Bruce 1968:171). Likewise, women's educational experiences may condition their ability to determine their own fertility and may open new avenues to personal autonomy achievement as well (Newland 1979:40). Thus, an analysis of the degree and extent of sexual stratification in education in contemporary societies has important implications for understanding women's educational options as well as for identifying areas in most need of change to ensure women's educational advancement.

2. Materials and Methods

Sexual stratification can be defined most succinctly as the degree of equality or inequality between the sexes. Most studies of sexual stratification in simple societies have assessed equality (and inequality) by focusing on one or more of three dimensions of social relations: relations of rewards, relations of prestige, and relations of power (Schlegel 1977:3). While equality or inequality along any of these three dimensions may be determined in qualitative studies of single cultures, it is not possible to determine the differential rewards, prestige, or power that may accrue to one or the other sex on a cross-national basis. Instead, however, it is possible to assess and define sexual stratification in terms of the degree of equality in the representation of the sexes. It is in this way that sexual stratification is operationalized in this paper to determine the extent of variation that exists cross-nationally in the realm of education.

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To assess the degree of equality in the representation of the sexes, a number of "indices of femaleness" are used. These indices are presented in the Handbook of International Data on Women (Boulding, Nuss, Carson, and Greenstein 1976), a compendium of national level statistics collected under the auspices of the United Nations (see the Handbook for a discussion of the problems with the comparability of national level data and for information concerning specific data limitations). An index of femaleness measures how "female" the population engaged in an activity undertaken by both women and men is (Boulding et al. 1976:7). Each index of femaleness is the ratio of the number of females in a particular area to the number of males and females in that area. As such, it measures the descrepancy between males and females in such a way that when this number is 0.5, the proportion of men and women in the area in question will be equal. When this value is less than 0.5, women will be underrepresented in comparison to men. When this value rises above 0.5, women will be represented more than men in the area in question. For example, the index of femaleness for illiteracy is calculated by dividing the number of female illiterates by the number of male and female illiterates in any given nation. It, therefore, measures the proportion of females among the illiterate population. If this index were 0.5 for any particular country, then the number of male and female illiterates would be equal. If, however, the value for this index were 0.98, it would indicate that women make up almost the entire illiterate population (98% of it). It could be concluded from this that the degree of inequality between the sexes in this area is great. Since illiteracy is a formidable handicap in many modern nations, this would indicate that women are highly disadvantaged in this area in comparison to men.

Descriptive statistics are used in this paper to determine the sorts of regularities and variablity that exist in sexual stratification in the educational realm cross-nationally. The distribution of each index is characterized in several ways. First, a frequency distribution is presented to give an idea of how each variable is distributed (BMDP5D, 1977 version, Dixon and Brown 1977). Three ranges are reported for each index: 0 to 0.44 to indicate the underrepresentation of women, 0.45 to 0.50 to indicate near equality or equality between the sexes, and 0.51 to 1.0 to indicate the overrepresentation of women in comparison to men. These intervals were chosen to give some latitutde to the definition of equality. Thus, while women would actually be underrepresented in comparison to men at any value less than 0.50, the range 0.45 to 0.50 has been chosen to express near equality as well as perfect equality (0.50). By contrast, to get an idea of the actual overrepresentation of women 0.51 is used, while 0.44 is used as the upper limit indicating the underrepresentation of women. These levels reflect, by definition, the actual overrepresentation and underrepresentation of women in comparison to men respectively. Thus, it is the concept of equality that is given more scope through the choice of these intervals. Second, the distribution of each "index of femaleness" is also characterized by the arithmetic mean (X) which is used as the measure of central tendency, and the standard deviation (SD) which is reported as the measure of dispersion about the mean.

These measures provide a picture of the variation in sexual stratification on a worldwide basis. In order to refine this picture somewhat, a one-way analysis of variance (SPSS, subprogram Oneway, 1980 version, Nie, Hull, Jenkins, Steinbrenner, Bent, 1975) is also computed (using

SNK as the a posteriori contrast test for comparing all possible pairs of group means) for each variable using geographic world region as the grouping variable. For all tests performed in this study, 0.05 is used as the significance level for the purposes of inference. By using geographic region as the grouping variable in an analysis of variance, variation which exists among the five major world regions is documented as well. The five major world regions are Africa, North Africa and the Middle East, Asia, Latin America, and Europe and North America. It should be pointed out that several of the variables subjected to this analysis of variance violate the assumption of homogeneity of variances (using Bartlett-Box F). However, due to the robustness of this statistical test, the results using these variables are included.

Sexual stratification in the area of education is analyzed using two sets of indices of femaleness. The first set is composed of two indices which deal with illiteracy. This includes the index of femaleness for illiteracy and the index of femaleness for literacy courses. The index of femaleness for illiteracy provides an indication of the discrepancy between men and women in terms of their ability to both read and write a simple message in any one language (Boulding et al. 1976:335). The index of femaleness in literacy courses provides a measure of female participation in literacy courses, and, thus, reflects the attempt or opportunity of women to overcome their illiteracy.

The second set of indices includes five variables which reflect the differential number of male and female graduates in various fields of specialization at the third level of education. Education at the third level includes:

> all degree-granting and non-degree granting institutions of higher education. Public and private universities, teacher-training colleges, and technical colleges (Boulding et al. 1976:34[illegible]).

The areas of specialization within third level institutions which are analyzed here include: education, law, the social sciences, engineering, and agriculture.

It should be noted that other indicators of the degree of sexual stratification in education which would make a study such as this more complete were not available or were not available in appropriate form for analysis. For instance, information concerning the existence of differential curricula for the sexes or the differential enrollment of males and females at all educational levels as well as their representation on faculties could not be included.

3. Interpretation of Results

3.1. Illiteracy

From Table 1-1 it is clear that women comprise a much larger proportion of the illiterate population on a worldwide basis than do men. In 90.4% of the sample women are overrepresented among the illiterate population. By contrast, in only 9.6% of the sample are women either equally represented with men or present in smaller numbers than men among illiterates. The nine countries in which women are present in equal, near-equal, or lower numbers than men include, from order of lowest illiteracy rate to highest: the

Table 1-1.

Variable 1: Index of Femaleness for Illiteracy
Measure of: the proportion of females among the illiterate population
Range: 0.428 to 0.815

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	3	3.2
0.45 - 0.50	equality or near equality	6	6.4
0.51 - 1.00	women overrepresented	85	90.4
Total		94	100

Mean 0.593
SD 0.087

People's Democratic Republic of Yemen, Kuwait, Cuba, Jamaica, Bahrain, Lesotho, Uruguay, South Africa, and Rhodesia. It should be noted that the South African figures include only information for its African population for this index (Boulding et al. 1976:336).

When world geographic region is considered, it is clear that women comprise more of the illiterate population than do men in each area of the world. Two distinct groups emerge, however, for this variable. In the first, women's representation among the illiterate population is only slightly higher than for men. This group includes Africa ($\bar{X}$ = 0.5544, N = 21), Latin America ($\bar{X}$ = 0.5584, N = 28), and North Africa and the Middle East ($\bar{X}$ = 0.5759, N = 15). This discrepancy between women's and men's representation among the illiterate increases significantly in the second group which includes Europe and North America ($\bar{X}$ = 0.6528, N = 14) and Asia ($\bar{X}$ = 0.6395, N = 16).

Illiteracy is a formidable handicap since the ability to read or write a simple message is a minimum prerequisite for sucessful participation in the modern world with its emphasis on the written word. It is, therefore, important to know of women's opportunities to overcome this handicap in comparison to men's when assessing sexual stratification. Some (Boulding 1977:23) have suggested that women have relatively fewer opportunities to take literacy training than do men. While pure opportunity may not be the only factor reflected in Table 1-2, it is clear that this sample bears out this contention somewhat, since women are underrepresented in literacy training courses in nearly 70% of the sample. Women do, however, find equal or near-equal representation with men in literacy courses in 14.5% of the sample, and are overrepresented in comparison to men in 24.6% of the sample. Since women are overrepresented in the illiterate population in many nations, this

equal or overrepresentation of women in literacy courses may suggest that, in some nations, steps have been taken to ameliorate specifically the illiteracy problem among women.

Women's representation in literacy training courses in all areas of the world is lower than that of men's. While it is lowest in Europe and North America (X = 0.2485, N = 6) and highest in Asia (X = 0.4443, N = 19), there is no significant difference in terms of women's enrollment in literacy courses among the five geographic world regions.

3.2 Third Level Education

Table 1-3 represents sexual stratification in the field of education at the third level. The subjects included in the field of education are education, pedagogy (including subjects studied in teacher-training institutions), and physcial education. On a worldwide scale, women comprise more of the graduates in the field of education at the third level in 50% of the nations in the sample. This is not surprising since teaching, especially at the lower levels, has traditionally been a feminine-typed occupation seen as consistent with women's role as a caretaker of children.

When geographic world region is considered no very clear picture emerges. What is evident is that in Latin America (X = 0.6345, N = 18) and in Europe and North America (X = 0.5557, N = 26) women have the highest representation among graduates in education at the third level in comparison to the other world regions. They have the lowest representation in Africa (X = 0.2631, N = 12) in which women comprise a significantly smaller proportion of education graduates than in the other world regions.

Table 1-2.

Variable 2: Index of Femaleness in Literacy Courses
Measure of: the proportion of females enrolled in literacy courses
Range: 0.002 to 0.790

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	42	60.9
0.45 - 0.50	equality or near equality	10	14.5
0.51 - 1.00	women overrepresented	17	24.6
Total		69	100

Mean 0.379
SD 0.199

Table 1-3.

Variable 3: Index of Femaleness in Field of Education at the Third Level
Measure of: the proportion of females among the total number of persons graduating from third level institutions with a major field of study in education
Range: 0.067 to 0.905

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	33	38.4
0.45 - 0.50	equality or near equality	10	11.6
0.51 - 1.00	women overrepresented	43	50.0
Total		86	100

Mean 0.489
SD 0.211

As shown in Table 1-4, on a worldwide scale, women are severely underrepresented in the area of law at the third level of education. In only two countries of the world, Hungary (X = 0.4665) and Poland (X = 0.4618), do women even approach equality with men in this area. It is interesting to note that both these countries can be characterized as having developed, centrally planned economies. Women's higher representation in the male-typed specialization of law in these two countries may reflect the fact that many such "communist" countries have taken steps not only toward granting equality to women under the law, but in supporting social developments that free women from some of the constraints placed on them by traditional concepts (Chylinska 1968:67).

In no one world region do women have a significantly higher representation as law graduates than in any other. Women's representation in this field in each world region is consistently low. In order of highest representation to lowest, women's representation among third level education graduates in the area of law is Europe and North America (X = 0.1996, N = 28), Latin America (X = 0.1618, N = 17), North Africa and the Middle East ((X = 0.1317, N = 13), Africa (X = 0.1283, N = 8) and Asia (X = 0.1112, N = 11).

Table 1-5 indicates that while women lag considerably behind men in the area of graduates at the third level of education in the social sciences, their representation is higher in this area than in the area of law. In seven countries of the world, women's representation among social science graduates is higher than men's, albeit not that much higher. These include, form order of highest representation to lowest, Hungary (X = 0.5921), Thailand (X = 0.5838), the Philippines (X = 0.5804), Cyprus (X = 0.5500), Colombia (X = 0.5409), Chile (X = 0.5334), and Bulgaria (X = 0.5091). The opportunity for

Table 1-4.

Variable 4: Index of Femaleness in Field of Law at Third Level
Measure of: the proportion of females among the total number of persons graduating from third level institutions with a major field of study in law
Range: 0.008 to 0.466

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	75	97.4
0.45 - 0.50	equality or near equality	2	2.6
0.51 - 1.00	women overrepresented	0	0
Total		77	100

Mean 0.160
SD 0.110

Table 1-5.

Variable 5: Index of Femaleness in Field of Social Sciences at Third Level
Measure of: the proportion of females among the total number of persons graduating from third level institutions with a major field of study in the social sciences
Range: 0.014 to 0.592

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	74	86.0
0.45 - 0.50	equality or near equality	5	5.9
0.51 - 1.00	women overrepresented	7	8.1
Total		86	100

Mean 0.250
SD 0.161

women to find equal, near-equal, or overrepresentation in comparison to men in 14% of the nations included in the sample speaks well for women in these countries since some subjects included within the social sciences, such as banking, commerce, diplomacy, economics, international relations, public administration and statistics may provide critical skills in the area of economic development (Boulding 1966:9). However, whether these skills are translated into employment positions is not discernable from these data.

When analyzed by world region it is apparent that women's training in the social sciences falls considerably below that of men's in all five geographic regions since the mean score for each world region falls below 0.35. Africa shows the greatest discrepancy from equality (X = 0.1302, N = 13). However, this low score is only significantly different from those for Europe and North America (X = 0.2790, N = 27) and Latin America (X = 0.3430, N = 17).

Table 1-6 represents the degree of sexual stratification at the third level of education in the area of engineering. Engineering has been identified as one field of education that is crucial to economic development since it includes such subjects as applied science, construction, geodesy, metallurgy, mining, surveying, technology, textiles and similar subjects (Boulding et al. 1976:346). However, women are severely underrepresented in the world's higher institutions of learning in the area of engineering with no nation in this sample having a higher mean score than 0.2817. It is interesting to note that the five nations with the highest scores on this index include: Bulgaria (X = 0.2817), Romania (X = 0.2468), Hungary (X = 0.2140), Poland (X = 0.1823), and Czechoslovakia (X = 0.1653). All these are Eastern block countries, which, some have suggested, have made conscious efforts to change traditional concepts concerning women's proper

Table 1-6.

Variable 6: Index of Femaleness in the field of Engineering at the Third Level

Measure of: the proportion of females among the total number of persons graduating from third level institutions with a major field of study in engineering

Range: 0.019 to 0.282

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	40	100
0.45 - 0.50	equality or near equality	0	0
0.51 - 1.00	women overrepresented	0	0
Total		40	100

Mean 0.071
SD 0.066

role in society. This effort may be responsible for the higher number of female graduates in the traditionally male specialization of engineering in these countries.

The overall underrepresentation of women in the field of engineering, however, seems to be consistent with the assertion that males and females often receive differential training beginning with the lowest levels of education. Here girls are often encouraged to excel in areas consistent with feminine identity such as language and domestic skills while math, science, and technical skills are predominantly masculine subjects (Newland 1979: 32). Engineering, with its emphasis on math, science, and technical skills, has even lower levels of representation for women, on the average, than the field of law.

The higher score for women in the Eastern block countries is reflected in the analysis by world region. Here the Europe and North America region, which includes these countries, shows the highest value for women in the area of third level education in engineering (X = 0.0739, N = 26). While the score for this region is not significantly different than the scores for Latin America (X = 0.0447, N = 15), North Africa and the Middle East (X = 0.0361, N = 7), it is significantly higher than that for Asia (X = 0.0170, N = 11). No data for African nations are available for this index.

As illustrated in Table 1-7, women fare only slightly better, in terms of of representation, in the field of agriculture (X = 0.107) at the third level of education than they do in engineering (X = 0.071). The subjects included under the heading of agricultural science such as agronomy, dairying, fisheries, forestry, hortiiculture, rural science, veterinary medicine and the like (Boulding et al. 1976: 346) are, as in the case of engineering,

Table 1-7.

Variable 7: Index of Femaleness in Field of Agriculture at the Third Level
Measure of: the proportion of females among the total number of persons graduating from third level institutions with a major field of study in agriculture
Range: 0.001 to 0.400

interval	description	no. of nations	percentage
0.00 - 0.44	women underrepresented	65	100
0.45 - 0.50	equality or near equality	0	0
0.51 - 1.00	women overrepresented	0	0
Total		65	100

Mean 0.107
SD 0.098

subjects which provide more saleable economic skills (Geile 1977:23). Therefore, women's extremely low representation in these two areas of training does not speak well for potential employment opportunities for women on a worldwide scale.

This appears to be the case for all five geographic regions as well since there is no significant difference among any of the five world regions on this variable. Women have the lowest representation in North Africa and the Middle East ($X = 0.0609$, $N = 7$) followed by Asia ($X = 0.0853$, $N = 12$), Latin America ($X = 0.0900$, $N = 14$), and Europe and North America ($X = 0.1263$, $N = 26$), while Africa has the highest score ($X = 0.1591$, $N = 6$). While this score for Africa is still quite low, the fact that it is higher than in the other world regions may reflect the general emphasis in many African nations since the 1960's to concentrate on developing the agricultural sector of their economies.

4. Discussion

When stratification is defined in terms of equal representation, it is clear that the discrepancy between the sexes in the educational sphere is still quite large. Women are highly overrepresented in the illiterate population of the world and yet, underrepresented to a large extent, in literacy training courses. When field of educational specialization is considered, women have their highest representation among third level graduates in the field of education where, on a worldwide basis, 50% of such graduates are women. The next most highly "female" field of specialization is in the social sciences. Women are, however, only equally represented or overrepresented in this area in 14% of the nations included in this study.

Women's representation decreases drastically in the fields of law, agriculture, and engineering.

When these fields of specialization are analyzed by world region, there is no consistent pattern. For instance, women have the highest representation in law and engineering in Europe and North America, the highest representation in education and the social sciences in Latin America, and the highest representation in the agricultural sciences in Africa. This may indicate that ideas concerning sex appropriate training are changing most in the Europe and North America region since women are finding higher representation in the masculine-typed fields of law and engineering. By contrast, such ideas may be changing least in Latin America where women find a higher representation in the feminine-typed field of education, and to a lesser extent, the social sciences.

Educational opportunities are clearly related to many areas of women's lives. For example, the highest employment rates are found among women who have had advanced professional training (Newland 1979:41). Similarly, virtually everywhere, political leadership comes from the ranks of the educated. In almost all countries, the more education women have, the fewer children they will bear (Newland 1979:42). This is probably due, in part, to the fact that birth control information is more available to and better understood by educated women as well as the fact that education can reduce desired family size by causing women to aspire to a standard of living incompatible with a large family (Smock 1977:403). Lastly, education confers status in its own right since it is almost universally valued as both a productive investment and a consumer good (Newland 1979:5). Given this, the results of this study indicate that women's limited educational opportunities

do not speak well for women's overall advancement and status achievement in many areas of life and in many areas of the world.

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